

# SEQUENCE LISTING

<110> Cahoon, Edgar B.  
Cahoon, Rebecca E.  
Kinney, Anthony J.  
Rafalski, J. Antoni

<120> TRIACYLGLYCEROL LIPASES

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<150> 60/083,688

<151> 1988-04-30

<150> PCT/US99/09280

<151> 1999-04-29

<150> 09/699,652

<151> 2000-10-30

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His Phe Ala Gln Thr Val Arg Asp Gly Val Leu Thr Lys Tyr Asp Tyr
      35          40          45
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Val Tyr Arg Met Ser Gly Ile Pro Pro Ser Phe Pro Leu Phe Leu Ser  
65 70 75 80

Tyr Gly Gly Arg Asp Ser Leu Ala Asp Pro Ala Asp Val Arg Leu Leu  
85 90 95

Leu Gln Asp Leu Arg Gly His Asp Gln Asp Lys Leu Thr Val Gln Tyr  
100 105 110

Leu Asp Lys Phe Ala His Leu Asp Phe Ile Ile Gly Val Cys Ala Lys  
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Glu Ser Arg Pro Pro Val Tyr Asp Leu Ser Lys Ile Pro Leu Asp Ile  
35 40 45

Pro Leu Phe Leu Ser Tyr Gly Gly Gln Asp Ala Leu Ser Asp Val Lys  
50 55 60

Asp Val Glu Thr Leu Leu Asp Ser Leu Lys Leu His Asp Val Asp Lys  
65 70 75 80

Leu His Val Gln Tyr Ile Lys Asp Tyr Ala His Ala Asp Phe Ile Ile  
85 90 95

Gly Val Thr Ala Lys Asp Ile Val Tyr Asn Gln Ile Val Thr Phe Phe  
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gccggaggag gagggccgaa gccggccgccg gttctgctgc aacatggggg tcttgtggac 300  
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gggtaaatcg gctgtatgtt aagccaattg gctaacgagt catatgcaac tgctctcgag 660  
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20 25 30  
Phe Leu Pro Gln Asn Asp Val Val Leu Pro Pro Asp Gly Val Cys Ser  
35 40 45  
Thr Ala Val Thr Val His Gly Tyr Lys Cys Gln Glu Phe Glu Val Thr  
50 55 60  
Thr Asp Asp Gly Tyr Ile Leu Ser Val Gln Arg Ile Leu Glu Gly Arg  
65 70 75 80  
Ala Gly Gly Gly Gly Pro Lys Arg Pro Pro Val Leu Leu Gln His Gly  
85 90 95  
Val Leu Val Asp Gly Met Thr Trp Leu Val Asn Gly Pro Glu Gln Ser  
100 105 110  
Leu Ala Met Ile Leu Ala Asp Asn Gly Phe Asp Val Trp Ile Ser Asn  
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gatcacgtca gtgctagttt tgttcttaga gcagttgcca tgcattctga tgagatgctt 720  
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35 40 45  
Gly Gly Arg Trp Pro Leu Pro Ala Ala Ala Pro Ala Ala Gly Tyr Pro  
50 55 60  
Cys Thr Glu His Thr Val Gln Thr Asp Asp Gly Phe Leu Leu Ser Leu  
65 70 75 80  
Gln His Ile Pro His Gly Arg Asn Gly Ile Ala Asp Asn Thr Gly Pro  
85 90 95  
Pro Val Phe Leu Gln His Gly Leu Phe Gln Gly Gly Asp Thr Trp Phe  
100 105 110  
Ile Asn Ser Asn Glu Gln Ser Leu Gly Tyr Ile Leu Ala Asp Asn Gly  
115 120 125  
Phe Asp Val Trp Val Gly Asn Val Arg Gly Thr Arg Trp Ser Lys Gly  
130 135 140  
His Ser Thr Leu Ser Val His Asp Lys Leu Phe Trp Asp Trp Ser Trp  
145 150 155 160  
Gln Asp Leu Ala Glu Tyr Asp Val Leu Ala Met Leu Ser Tyr Val Tyr  
165 170 175  
Thr Val Ala Gln Ser Lys Ile Leu Tyr Val Gly His Ser Gln Gly Thr  
180 185 190  
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195 200 205  
Ser Ser Ala Ala Leu Leu Cys Pro Ile Ser Tyr Leu Asp His Val Ser  
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Ala Ser Phe Val Leu Arg Ala Val Ala Met His Leu Asp Glu Met Leu  
225 230 235 240  
Val Ile Met Gly Ile His Gln Leu Asn Phe Arg Ser Asp Met Gly Val  
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Gln Ile Leu Asp Ser Leu Cys Asp Asp Glu His Leu Asp Cys Asn Asp  
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 Arg Asn Thr Thr Asn Asp Ile Ser Asp Asp Lys Cys Pro Pro Gln Pro  
 35 40 45  
 His Pro Leu Xaa Met Cys Arg Ser Arg Val Ala Ala Tyr Gly Tyr Pro  
 50 55 60

Cys Glu Glu Tyr His Val Thr Thr Glu Asp Gly Tyr Ile Leu Ser Leu  
 65 70 75 80  
 Lys Lys Ile Pro Tyr Gly Leu Ser Gly Xaa Thr Xaa Ile Thr Arg Xaa  
 85 90 95  
 Pro Val Leu Leu Phe His Gly Leu Leu Val Asp Gly Phe Cys Trp Val  
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                     20                    25                    30  
 Gln Thr Gly Gln Lys Pro His Tyr Val Gly His Ser Met Gly Thr Leu  
                     35                    40                    45  
 Val Ala Leu Ala Ala Phe Ser Glu Gly Arg Val Val Ser Gln Leu Lys  
                     50                    55                    60  
 Ser Ala Ala Leu Leu Thr Pro Val Ala Tyr Leu Xaa His Xaa Asn Xaa  
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      20             25             30

Ala Ala Ala Leu Arg Arg Val Gly Ser Gly Ser Gly Gly Leu Cys Asp
      35             40             45

Gln Leu Leu Leu Pro Leu Gly Tyr Pro Cys Thr Glu His Asn Val Glu
      50             55             60

Thr Lys Asp Gly Phe Leu Leu Ser Leu Gln His Ile Pro His Gly Lys
      65             70             75             80

Asn Lys Ala Ala Asp Ser Thr Gly Pro Pro Val Phe Leu Gln His Gly
      85             90             95

Leu Phe Gln Gly Gly Asp Thr Trp Phe Ile Asn Ser Ala Glu Gln Ser
      100            105            110

Leu Gly Tyr Ile Leu Ala Asp Asn Gly Phe Asp Val Trp Ile Gly Asn
      115            120            125

Val Arg Gly Thr Arg Trp Ser Lys Gly His Ser Thr Phe Ser Val His
      130            135            140

Asp Lys Leu Phe Trp Asp Trp Ser Trp Gln Glu Leu Ala Glu Tyr Asp
      145            150            155            160

Leu Leu Ala Met Leu Gly Tyr Val Tyr Thr Val Thr Gln Ser Lys Ile
      165            170            175

Leu Tyr Val Gly His Ser Gln Gly Thr Ile Met Gly Leu Ala Ala Leu
      180            185            190

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Val	Ala	Met	His	Leu	Asp	Gln	Met	Leu	Val	Thr	Met	Gly	Ile	His	Gln
225					230					235					240
Leu	Asn	Phe	Arg	Ser	Asp	Met	Gly	Val	Gln	Ile	Val	Asp	Ser	Leu	Cys
				245					250					255	
Asp	Gly	Glu	His	Val	Asp	Cys	Asn	Asn	Leu	Leu	Ser	Ala	Ile	Thr	Gly
			260					265					270		
Glu	Asn	Cys	Cys	Phe	Asn	Thr	Ser	Arg	Ile	Asp	Tyr	Tyr	Leu	Glu	Tyr
		275					280					285			
Glu	Pro	His	Pro	Ser	Ser	Thr	Lys	Asn	Leu	His	His	Leu	Phe	Gln	Met
	290					295					300				
Ile	Arg	Lys	Gly	Thr	Phe	Ala	Lys	Tyr	Asp	Tyr	Gly	Leu	Leu	Gly	Asn
305					310					315					320
Leu	Arg	Arg	Tyr	Gly	His	Leu	Arg	Pro	Pro	Ala	Phe	Asp	Leu	Ser	Ser
				325					330					335	
Ile	Pro	Glu	Ser	Leu	Pro	Ile	Trp	Met	Gly	Tyr	Gly	Gly	Leu	Asp	Ala
			340					345					350		
Leu	Ala	Asp	Val	Thr	Asp	Val	Gln	Arg	Thr	Ile	Arg	Glu	Leu	Gly	Ser
		355					360					365			
Thr	Pro	Glu	Leu	Leu	Tyr	Ile	Gly	Asp	Tyr	Gly	His	Ile	Asp	Phe	Val
	370					375					380				
Met	Ser	Val	Lys	Ala	Lys	Asp	Asp	Val	Tyr	Val	Asp	Leu	Ile	Arg	Phe
385					390					395					400
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 ggggtttctga ccaagtacga ctacgtgatg ccggacgcga acgtggccag gtacgggcag 180  
 gncgacccgc cggcgtacga catggcggcg atcccggcgt ggttcccat cttcctcagc 240  
 tacggcggcc gggactcgct gtccnaccct gccgatcgtc gccctcctcc tcgacgatcn 300  
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 His Leu Ala Gln Thr Val Arg Asp Gly Val Leu Thr Lys Tyr Asp Tyr  
 35 40 45  
 Val Met Pro Asp Ala Asn Val Ala Arg Tyr Gly Gln Xaa Asp Pro Pro  
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 aatacattaa cacttcaatc ccacgctttc aatagataga tagagcattc attcatcacc 180  
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 gtggagatta agtaacggct aattacaaaa gtaatgaagt attatcacta gtgatttgct 1560  
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 <213> Glycine max

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 Leu Gly Arg Asn Ile Asn Pro Ser Val Tyr Gly Ile Cys Ala Ser Ser  
 35 40 45  
 Val Ile Val His Gly Tyr Lys Cys Gln Glu His Glu Val Thr Thr Asp  
 50 55 60  
 Asp Gly Tyr Ile Leu Ser Leu Gln Arg Ile Pro Glu Gly Arg Gly Lys  
 65 70 75 80  
 Ser Ser Gly Ser Gly Thr Arg Lys Gln Pro Val Val Ile Gln His Gly  
 85 90 95

Val	Leu	Val	Asp	Gly	Met	Thr	Trp	Leu	Leu	Asn	Pro	Pro	Glu	Gln	Asp		
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Leu	Pro	Leu	Ile	Leu	Ala	Asp	Asn	Gly	Phe	Asp	Val	Trp	Ile	Ala	Asn		
		115					120					125					
Thr	Arg	Gly	Thr	Arg	Tyr	Ser	Arg	Arg	His	Ile	Ser	Leu	Asp	Pro	Ser		
	130					135					140						
Ser	Gln	Ala	Tyr	Trp	Asn	Trp	Ser	Trp	Asp	Glu	Leu	Val	Ser	Tyr	Asp		
145					150					155					160		
Phe	Pro	Ala	Val	Phe	Asn	Tyr	Val	Phe	Ser	Gln	Thr	Gly	Gln	Lys	Ile		
				165					170					175			
Asn	Tyr	Val	Gly	His	Ser	Leu	Gly	Thr	Leu	Val	Ala	Leu	Ala	Ser	Phe		
			180					185					190				
Ser	Glu	Gly	Lys	Leu	Val	Thr	Gln	Leu	Lys	Ser	Ala	Ala	Leu	Leu	Ser		
		195					200					205					
Pro	Ile	Ala	Tyr	Leu	Ser	His	Met	Asn	Thr	Ala	Leu	Gly	Val	Val	Ala		
	210					215					220						
Pro	Lys	Ser	Phe	Val	Gly	Glu	Ile	Thr	Thr	Leu	Phe	Gly	Leu	Ala	Glu		
225					230					235					240		
Phe	Asn	Pro	Lys	Gly	Leu	Ala	Val	Asp	Ala	Phe	Leu	Lys	Ser	Leu	Cys		
				245					250					255			
Ala	His	Pro	Gly	Ile	Asp	Cys	Tyr	Asp	Leu	Leu	Thr	Ala	Leu	Thr	Gly		
			260					265					270				
Lys	Asn	Cys	Cys	Leu	Asn	Ser	Ser	Thr	Val	Asp	Leu	Phe	Leu	Met	Asn		
	275						280					285					
Glu	Pro	Gln	Ser	Thr	Ser	Thr	Lys	Asn	Met	Val	His	Leu	Ala	Gln	Thr		
	290					295					300						
Val	Arg	Leu	Gly	Ala	Leu	Thr	Lys	Phe	Asn	Tyr	Val	Arg	Pro	Asp	Tyr		
305					310					315					320		
Asn	Ile	Met	His	Tyr	Gly	Glu	Ile	Phe	Pro	Pro	Ile	Tyr	Asn	Leu	Ser		
				325					330					335			
Asn	Ile	Pro	His	Asp	Leu	Pro	Leu	Phe	Ile	Ser	Tyr	Gly	Gly	Arg	Asp		
			340					345					350				
Ala	Leu	Ser	Asp	Val	Arg	Asp	Val	Glu	Asn	Leu	Leu	Asp	Lys	Leu	Lys		
		355					360					365					
Phe	His	Asp	Glu	Asn	Lys	Arg	Ser	Val	Gln	Phe	Ile	Gln	Glu	Tyr	Ala		
	370					375					380						
His	Ala	Asp	Tyr	Ile	Met	Gly	Phe	Asn	Ala	Lys	Asp	Leu	Val	Tyr	Asn		
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 tccgagcata cgattcaaac gaaggatggt ttcttggttag gtcttcaacg tgtctcttct 240  
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 <212> PRT  
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 Gln Lys Gln Gln His Ser Leu Cys Glu Glu Leu Ile Ile Pro Tyr Gly  
 35 40 45  
 Tyr Pro Cys Ser Glu His Thr Ile Gln Thr Lys Asp Gly Phe Leu Leu  
 50 55 60  
 Gly Leu Gln Arg Val Ser Ser Ser Ser Leu Arg Leu Arg Asn His  
 65 70 75 80  
 Gly Asp Gly Gly Pro Pro Val Leu Leu Leu His Gly Leu Phe Met Ala  
 85 90 95  
 Gly Asp Ala Trp Phe Leu Asn Thr Pro Glu Gln Ser Leu Gly Phe Ile  
 100 105 110  
 Leu Ala Asp His Gly Phe Asp Val Trp Val Gly Asn Val Arg Gly Thr  
 115 120 125





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<213> Zea mays

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Ala Val Tyr Phe Gly Glu Gln Val Pro Arg Thr Ile Arg Val Thr His
          35             40             45

Gln Asn Asp Ile Val Pro His Leu Pro Pro Tyr Tyr Tyr Tyr Leu Gly
          50             55             60

Glu Trp Thr Tyr His His Phe Ala Arg Glu Val Trp Leu His Glu Ser
          65             70             75             80

Ile Asp Gly Asn Val Val Thr Arg Asn Glu Thr Val Cys Asp Asp Ser
          85             90             95

Gly Glu Asp Pro Thr Cys Ser Arg Ser Val Tyr Gly Met Ser Val Ala
          100            105            110

Asp His Leu Glu Tyr Tyr Asp Val Thr Leu His Ala Asp Ser Arg Gly
          115            120            125

Thr Cys Gln Phe Val Ile Gly Ala Ala Asn Gln Val Tyr Asn Tyr Val
          130            135            140

Arg Glu Val Asp Gly Ser Ile Ile Leu Ser Arg Tyr Pro Gln Glu Pro
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Gln Ala Leu Glu Ser Met
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 caaaggtgca cagtggattt ttctcctcgt ataacaatac aattttgcgt ctacttatca 540  
 caagtgtctg gcacaaggca agaaagtcac atggagatat caatgtcata gtgacaggcc 600  
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 aaaatcatag gacgtttatg ctgattggna ggattgctnt ggtaatanat gancatgtaa 1380  
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 <212> PRT  
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 20 25 30  
 Arg Ser Phe Ile Tyr Asn His Thr Leu Ala Lys Thr Leu Val Glu Tyr  
 35 40 45  
 Ala Xaa Ala Val Tyr Met Thr Asp Leu Thr Ala Leu Phe Thr Trp Thr  
 50 55 60  
 Cys Ser Arg Cys Asn Asp Leu Thr Gln Gly Phe Glu Met Arg Ser Xaa  
 65 70 75 80  
 Ile Val Asp Val Glu Lys Leu Leu Ala Gly Ile Val Gly Val Asp His  
 85 90 95  
 Ser Leu Asn Ser Ile Ile Val Ala Ile Arg Gly Thr Gln Glu Asn Ser  
 100 105 110  
 Val Gln Asn Trp Ile Lys Asp Leu Ile Trp Lys Gln Leu Asp Leu Ser  
 115 120 125  
 Xaa Pro Asn Met Pro Asn Ala Lys Val His Ser Gly Phe Phe Ser Ser  
 130 135 140  
 Tyr Asn Asn Thr Ile Leu Arg Leu Ala Ile Thr Ser Ala Val His Lys  
 145 150 155 160  
 Ala Arg Lys Ser Tyr Gly Asp Ile Asn Val Ile Val Thr Gly His Ser  
 165 170 175  
 Met Gly Gly Ala Met Ala Ser Phe Cys Ala Leu Asp Leu Ala Met Lys  
 180 185 190  
 Leu Gly Gly Gly Ser Val Gln Leu Met Thr Phe Gly Gln Pro Arg Val  
 195 200 205  
 Gly Asn Ala Ala Phe Ala Ser Tyr Phe Ala Lys Tyr Val Pro Asn Thr  
 210 215 220  
 Ile Arg Val Thr His Gly His Asp Ile Val Pro His Leu Pro Pro Tyr  
 225 230 235 240

Phe	Ser	Phe	Leu	Pro	Gln	Leu	Thr	Tyr	His	His	Phe	Pro	Arg	Glu	Val
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Trp	Val	Gln	Asp	Ser	Asp	Gly	Asn	Thr	Thr	Glu	Arg	Ile	Cys	Asp	Asp
			260					265					270		
Ser	Gly	Glu	Asp	Pro	Asp	Cys	Cys	Arg	Cys	Ile	Ser	Met	Phe	Gly	Leu
		275					280					285			
Arg	Ile	Gln	Asp	His	Ser	Leu	Thr								
	290					295									

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Glu Glu Asp Gly Lys Asp Ala Thr Arg Ala Phe Pro Xaa Gly Ala Pro  
35 40 45  
Asn Ala Val Pro Gly Lys Pro Leu Ala Tyr Tyr Ala Leu Arg Glu Glu  
50 55 60  
Val Gln Lys Gln Leu Gln Lys His Pro Asn Ala Asn Val Val Val Thr  
65 70 75 80  
Gly His Ser Leu Gly Ala Ala Leu Ala Thr Ile Phe Pro Ala Leu Leu  
85 90 95  
Ala Phe His Gly Glu Arg Gly Val Leu Asp Arg Leu Leu Ser Val Val  
100 105 110  
Thr Tyr Gly Gln Pro Arg Val Gly Asp Lys Val Phe Ala Gly Tyr Val  
115 120 125  
Arg Ala Asn Val Pro Val Glu Pro Leu Arg Val Val Tyr Arg Tyr Asp  
130 135 140  
Val Val Pro Arg Val Pro Phe Asp Ala Pro Pro Val Ala Asp Phe Ala  
145 150 155 160  
His Gly Gly Thr Cys Val Tyr Phe Asp Gly Trp Tyr Lys Gly Arg Glu  
165 170 175  
Ile Ala Lys Gly Gly Asp Ala Pro Asn Lys Asn Tyr Phe Asp Pro Arg  
180 185 190  
Tyr Leu Leu Ser Met Tyr Gly Asn Ala Trp Gly Asp Leu Phe Lys Gly  
195 200 205  
Ala Phe Leu Trp Ala Lys Glu Gly Lys Asp Tyr Arg Glu Gly Ala Val  
210 215 220  
Ser Leu Leu Tyr Arg Ala Thr Gly Leu Leu Val Pro Gly Ile Ala Ser  
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His Ser Pro Arg Asp Tyr Val Asn Ala Val Arg Leu Gly Ser Val Ala  
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Ser Ala

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 <223> n=A, C, G, or T

<220>  
 <221> unsure  
 <222> (99)  
 <223> n=A, C, G, or T

<220>  
 <221> unsure  
 <222> (103)  
 <223> n=A, C, G, or T

<220>  
 <221> unsure  
 <222> (105)  
 <223> n=A, C, G, or T

<220>  
 <221> unsure  
 <222> (117)  
 <223> n=A, C, G, or T

<400> 27  
 catagtnata atacnaacag ttgcggncat tgagattntt ggaaatctgn tcggtgggca 60  
 aggaagacat atggaaggct acctataaat gttntaggt cantncgatg ggagggncct 120  
 tttagcatcg ttcttggtgcc cttgacctct cttgttaagt atggatcgca ggaagttcaa 180  
 ctcacatgactt ttggacagcc tcgggtaggc aatccttctt ttgctgcgta cttcagtgac 240  
 caagtcccga gaacaatccg tgtgacccat cagaatgaca ttgtcccaca cttgccacca 300  
 tattttttgct accttggtgga atggacatat caccacttct cgagagaggt ttggcttcat 360  
 gagaccatag taggaaatgt agttactagg aatgagacca tctgtgatgg atcaggcgag 420  
 gacccaacat gc 432

<210> 28  
 <211> 106  
 <212> PRT  
 <213> Oryza sativa

<400> 28  
 Gly Pro Phe Ser Ile Val Leu Val Pro Leu Thr Ser Leu Val Lys Tyr  
           1                          5                          10                          15  
 Gly Ser Gln Glu Val Gln Leu Met Thr Phe Gly Gln Pro Arg Val Gly  
                           20                          25                          30  
 Asn Pro Ser Phe Ala Ala Tyr Phe Ser Asp Gln Val Pro Arg Thr Ile  
                           35                          40                          45  
 Arg Val Thr His Gln Asn Asp Ile Val Pro His Leu Pro Pro Tyr Phe  
           50                          55                          60  
 Cys Tyr Leu Gly Glu Trp Thr Tyr His His Phe Ser Arg Glu Val Trp  
           65                          70                          75                          80  
 Leu His Glu Thr Ile Val Gly Asn Val Val Thr Arg Asn Glu Thr Ile  
                           85                          90                          95  
 Cys Asp Gly Ser Gly Glu Asp Pro Thr Cys  
                           100                          105

<210> 29  
 <211> 1234  
 <212> DNA  
 <213> Glycine max

<400> 29  
 ccactggaag atggaattcg tgagattttt tgattgctgg gaatgatttt caagaaaagg 60  
 ccacaaccca agtcttgatt gttttggaca agcatgagaa ccgcgatact tatgtggtag 120  
 ctttccgagg aacggaaccc tttgatgcag atgcatgggt cactgacctt gacatctcat 180  
 ggtacgcatt cccggcattg gaaaaatgca tgggtggcttc atgaaagcct tagggctaca 240  
 gaaaaatgtg ggggtggccta aggagattca aagggatgaa aatcttcccc cgttggccta 300  
 ctatgttatt agggacattc taaggaaaagg tttgagttaa aatcctaata caaagtttat 360  
 cattacgggt catagtttgg gtggagcact cgcaatcttg taccctacga tcatgttctt 420  
 gcatgatgag aagttgctga ttgagaggtt ggaagggatc tacacgtttg ggcaaccaag 480  
 agttggagat gaagcatatg cacagtatat gagacaaaaa ttgagggaaa attctatcag 540  
 gtattgcagg tttgtttatt gcaatgacat agttccgagg ttgccctatg atgataagga 600  
 cttgctcttc aagcactttg ggatctgcct tttctttaac aggcgctatg aactcaggat 660  
 tctcgaagaa gagccgaata agaactatct ctgccatgg tgtgtgatac ccatgatggt 720  
 caatgctgtt ttggaactaa taaggagcct taccatagcg tacaaaaatg gacctcacta 780  
 tagagaagga tggtttctct ttagtttcag gttggttggt ctgctgattc ctggcttacc 840  
 tgctcacggg ccacaagatt atattaattc cactcttctg ggatcaattg aaaaacattt 900  
 taaagcagat tgatgtgtcc gtatacatga tcattccata ccactacgta catgtgtatg 960  
 gtcatgcaga ctaaaattta cataatcaag atttttagtt ttagaaaaaa tggtaataac 1020  
 acttgattat gtatcatgtg aagaatagtt atgtatcata atgatcatga ataataaac 1080  
 agtttgtcgt cagtacgagt tattgtatag taattaataa gctagggtta aagttgtttc 1140  
 ctttggtgca tggatttatc attaatgaga tcaatgtgaa gtttgtttat ttcaaaaaaa 1200  
 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaa 1234

<210> 30  
 <211> 246  
 <212> PRT  
 <213> Glycine max

<400> 30  
 His Leu Met Val Arg Ile Pro Gly Ile Gly Lys Met His Gly Gly Phe  
           1                          5                          10                          15  
 Met Lys Ala Leu Gly Leu Gln Lys Asn Val Gly Trp Pro Lys Glu Ile  
                           20                          25                          30





<212> PRT  
 <213> Glycine max

<400> 32  
 His Glu Glu Arg Trp Pro Lys Glu Ile Glu Thr Asp Glu Asn Arg Pro  
 1 5 10 15  
 Arg Val Tyr Tyr Ser Ile Arg Asp Leu Leu Lys Lys Cys Leu Asn Arg  
 20 25 30  
 Asn Asp Lys Ala Lys Phe Ile Leu Thr Gly His Ser Leu Gly Gly Ala  
 35 40 45  
 Leu Ala Ile Leu Phe Pro Ala Met Leu Ile Leu His Ala Glu Thr Phe  
 50 55 60  
 Leu Leu Glu Arg Leu Glu Gly Val Tyr Thr Phe Gly Gln Pro Arg Val  
 65 70 75 80  
 Gly Asp Glu Thr Phe Ala Lys Tyr Met Glu Asn Gln Leu Lys His Tyr  
 85 90 95  
 Gly Ile Lys Tyr Phe Arg Phe Val Tyr Cys Asn Asp Ile Val Pro Arg  
 100 105 110  
 Leu Pro Phe Asp Glu Asp Ile Met Lys Phe Glu His Phe Gly Thr Cys  
 115 120 125  
 Leu Tyr Tyr Asp Arg Ser Tyr Thr Cys Lys Val His Ile  
 130 135 140

<210> 33  
 <211> 774  
 <212> DNA  
 <213> Triticum aestivum

<400> 33  
 gcacgagaat attcccatca tgggtgacagg acattccatg ggagggggcca tggcttcggt 60  
 ttgtgcccctt gatcttattg tcaactatgg gttaaaggac gtgaccctgc tgacatttgg 120  
 gcaacctcgg attggtaatg ctgtgtttgc taccacttt aagaaatact tgccaaacgc 180  
 aattcgagtt accaacgcac atgatattgt gcctcatcta cccccgtact accagtactt 240  
 cccacagaat acctaccatc atttcccacc agaggtttgg gttcataaca ttggactcga 300  
 tagcctacta taccgatcg agcacatctg tgatcattct ggagaaagac cccacttgca 360  
 gcaggcccctt ggttggaat agcgtccagg cccatacccc ctttcttggc tccagcatcc 420  
 atccccgagtc gcgcggatca tccagaatcg tcacggatga caatatgctc aggcacaaag 480  
 ttgcccctgt agacggtgtt attgtcttct cgaagcagcc tggtttatca gttggtcagc 540  
 tactcagtac acagtaaaca agctcaagat tacatggatt tattttgatg tttttttttg 600  
 ccaaagaaca atattcttgt tggcaatcaa agcactatct catgtatata tacgcgtgtg 660  
 atcctggctg gattaaatta tctagctga ggggtgattt ctgaaatgta caaacatatc 720  
 tatgctgatt aaaaaaaaaa aaaaaaatac ttgaggcggc cccgtaccaa aaat 774

<210> 34  
 <211> 126  
 <212> PRT  
 <213> Triticum aestivum

<400> 34  
 His Glu Asn Ile Pro Ile Met Val Thr Gly His Ser Met Gly Gly Ala  
 1 5 10 15

Met Ala Ser Phe Cys Ala Leu Asp Leu Ile Val Asn Tyr Gly Leu Lys  
                   20                                  25                                  30  
 Asp Val Thr Leu Leu Thr Phe Gly Gln Pro Arg Ile Gly Asn Ala Val  
                   35                                  40                                  45  
 Phe Ala Thr His Phe Lys Lys Tyr Leu Pro Asn Ala Ile Arg Val Thr  
                   50                                  55                                  60  
 Asn Ala His Asp Ile Val Pro His Leu Pro Pro Tyr Tyr Gln Tyr Phe  
                   65                                  70                                  75                                  80  
 Pro Gln Asn Thr Tyr His His Phe Pro Pro Glu Val Trp Val His Asn  
                                   85                                  90                                  95  
 Ile Gly Leu Asp Ser Leu Leu Tyr Pro Ile Glu His Ile Cys Asp His  
                   100                                  105                                  110  
 Ser Gly Glu Arg Pro His Leu Gln Gln Ala Leu Gly Trp Lys  
                   115                                  120                                  125  
  
 <210> 35  
 <211> 398  
 <212> PRT  
 <213> Canis familiaris  
  
 <400> 35  
 Met Trp Leu Leu Leu Thr Ala Ala Ser Val Ile Ser Thr Leu Gly Thr  
   1                                  5                                  10                                  15  
 Thr His Gly Leu Phe Gly Lys Leu His Pro Thr Asn Pro Glu Val Thr  
                   20                                  25                                  30  
 Met Asn Ile Ser Gln Met Ile Thr Tyr Trp Gly Tyr Pro Ala Glu Glu  
                   35                                  40                                  45  
 Tyr Glu Val Val Thr Glu Asp Gly Tyr Ile Leu Gly Ile Asp Arg Ile  
                   50                                  55                                  60  
 Pro Tyr Gly Arg Lys Asn Ser Glu Asn Ile Gly Arg Arg Pro Val Ala  
                   65                                  70                                  75                                  80  
 Phe Leu Gln His Gly Leu Leu Ala Ser Ala Thr Asn Trp Ile Ser Asn  
                                   85                                  90                                  95  
 Leu Pro Asn Asn Ser Leu Ala Phe Ile Leu Ala Asp Ala Gly Tyr Asp  
                   100                                  105                                  110  
 Val Trp Leu Gly Asn Ser Arg Gly Asn Thr Trp Ala Arg Arg Asn Leu  
                   115                                  120                                  125  
 Tyr Tyr Ser Pro Asp Ser Val Glu Phe Trp Ala Phe Ser Phe Asp Glu  
                   130                                  135                                  140  
 Met Ala Lys Tyr Asp Leu Pro Ala Thr Ile Asp Phe Ile Leu Lys Lys  
                   145                                  150                                  155                                  160  
 Thr Gly Gln Asp Lys Leu His Tyr Val Gly His Ser Gln Gly Thr Thr  
                                   165                                  170                                  175

Ile Gly Phe Ile Ala Phe Ser Thr Asn Pro Lys Leu Ala Lys Arg Ile  
 180 185 190  
 Lys Thr Phe Tyr Ala Leu Ala Pro Val Ala Thr Val Lys Tyr Thr Glu  
 195 200 205  
 Thr Leu Leu Asn Lys Leu Met Leu Val Pro Ser Phe Leu Phe Lys Leu  
 210 215 220  
 Ile Phe Gly Asn Lys Ile Phe Tyr Pro His His Phe Phe Asp Gln Phe  
 225 230 235 240  
 Leu Ala Thr Glu Val Cys Ser Arg Glu Thr Val Asp Leu Leu Cys Ser  
 245 250 255  
 Asn Ala Leu Phe Ile Ile Cys Gly Phe Asp Thr Met Asn Leu Asn Met  
 260 265 270  
 Ser Arg Leu Asp Val Tyr Leu Ser His Asn Pro Ala Gly Thr Ser Val  
 275 280 285  
 Gln Asn Val Leu His Trp Ser Gln Ala Val Lys Ser Gly Lys Phe Gln  
 290 295 300  
 Ala Phe Asp Trp Gly Ser Pro Val Gln Asn Met Met His Tyr His Gln  
 305 310 315 320  
 Ser Met Pro Pro Tyr Tyr Asn Leu Thr Asp Met His Val Pro Ile Ala  
 325 330 335  
 Val Trp Asn Gly Gly Asn Asp Leu Leu Ala Asp Pro His Asp Val Asp  
 340 345 350  
 Leu Leu Leu Ser Lys Leu Pro Asn Leu Ile Tyr His Arg Lys Ile Pro  
 355 360 365  
 Pro Tyr Asn His Leu Asp Phe Ile Trp Ala Met Asp Ala Pro Gln Ala  
 370 375 380  
 Val Tyr Asn Glu Ile Val Ser Met Met Gly Thr Asp Asn Lys  
 385 390 395  
 <210> 36  
 <211> 403  
 <212> PRT  
 <213> Caenorhabditis elegans  
 <400> 36  
 Met Trp Arg Phe Ala Val Phe Leu Ala Ala Phe Phe Val Gln Asp Val  
 1 5 10 15  
 Val Gly Ser His Gly Asp Pro Glu Leu His Met Thr Thr Pro Gln Ile  
 20 25 30  
 Ile Glu Arg Trp Gly Tyr Pro Ala Met Ile Tyr Thr Val Ala Thr Asp  
 35 40 45  
 Asp Gly Tyr Ile Leu Glu Met His Arg Ile Pro Phe Gly Lys Thr Asn  
 50 55 60

Val	Thr	Trp	Pro	Asn	Gly	Lys	Arg	Pro	Val	Val	Phe	Met	Gln	His	Gly	
65					70					75					80	
Leu	Leu	Cys	Ala	Ser	Ser	Asp	Trp	Val	Val	Asn	Leu	Pro	Asp	Gln	Ser	
				85					90					95		
Ala	Gly	Phe	Leu	Phe	Ala	Asp	Ala	Gly	Phe	Asp	Val	Trp	Leu	Gly	Asn	
			100					105					110			
Met	Arg	Gly	Asn	Thr	Tyr	Ser	Met	Lys	His	Lys	Asp	Leu	Lys	Pro	Ser	
		115					120					125				
His	Ser	Ala	Phe	Trp	Asp	Trp	Ser	Trp	Asp	Glu	Met	Ala	Thr	Tyr	Asp	
	130					135					140					
Leu	Asn	Ala	Met	Ile	Asn	His	Val	Leu	Glu	Val	Thr	Gly	Gln	Asp	Ser	
145					150					155					160	
Val	Tyr	Tyr	Met	Gly	His	Ser	Gln	Gly	Thr	Leu	Thr	Met	Phe	Ser	His	
				165					170					175		
Leu	Ser	Lys	Asp	Asp	Gly	Ser	Phe	Ala	Lys	Lys	Ile	Lys	Lys	Phe	Phe	
			180					185					190			
Ala	Leu	Ala	Pro	Ile	Gly	Ser	Val	Lys	His	Ile	Lys	Gly	Phe	Leu	Ser	
		195					200					205				
Phe	Phe	Ala	Asn	Tyr	Phe	Ser	Leu	Glu	Phe	Asp	Gly	Trp	Phe	Asp	Ile	
	210					215					220					
Phe	Gly	Ala	Gly	Glu	Phe	Leu	Pro	Asn	Asn	Trp	Ala	Met	Lys	Leu	Ala	
225					230					235					240	
Ala	Lys	Asp	Ile	Cys	Gly	Gly	Leu	Lys	Val	Glu	Ala	Asp	Leu	Cys	Asp	
				245					250					255		
Asn	Val	Leu	Phe	Leu	Ile	Ala	Gly	Pro	Glu	Ser	Asp	Gln	Trp	Asn	Gln	
			260					265						270		
Thr	Arg	Val	Pro	Val	Tyr	Ala	Thr	His	Asp	Pro	Ala	Gly	Thr	Ser	Thr	
		275					280					285				
Gln	Asn	Ile	Val	His	Trp	Met	Gln	Met	Val	His	His	Gly	Gly	Val	Pro	
	290					295					300					
Ala	Tyr	Asp	Trp	Gly	Thr	Lys	Thr	Asn	Lys	Lys	Lys	Tyr	Gly	Gln	Ala	
305					310					315					320	
Asn	Pro	Pro	Glu	Tyr	Asp	Phe	Thr	Ala	Ile	Lys	Gly	Thr	Lys	Ile	Tyr	
				325					330					335		
Leu	Tyr	Trp	Ser	Asp	Ala	Asp	Trp	Leu	Ala	Asp	Thr	Pro	Asp	Val	Pro	
			340					345					350			
Asp	Tyr	Leu	Leu	Thr	Arg	Leu	Asn	Pro	Ala	Ile	Val	Ala	Gln	Asn	Asn	
		355					360					365				
His	Leu	Pro	Asp	Tyr	Asn	His	Leu	Asp	Phe	Thr	Trp	Gly	Leu	Arg	Ala	
	370					375					380					

Pro	Asp	Asp	Ile	Tyr	Arg	Pro	Ala	Ile	Lys	Leu	Cys	Thr	Asp	Asp	Tyr
385					390					395					400

Leu Gly Lys